AVICULTURAL MAGAZINE

VOLUME 118
No. 2
2012

THE AVICULTURAL SOCIETY

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Membership subscription rates per annum for 2012: British Isles £21.00: Overseas £24.00 (plus £6.00 for airmail). (U.K. funds please). The subscription is due on **1st January of each year** and those joining the Society later in the year will receive back numbers of the current volume of the AVICULTURAL MAGAZINE.

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AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

Vol. 118 - No. 2 ISSN 0005 2256 2012

The Avicultural Society

FOR THE STUDY OF BRITISH AND FOREIGN BIRDS
IN THE WILD AND CAPTIVITY

PAULTONS PARK - 2011

by Geoff Masson

As far as the bird collection was concerned, last year turned out to be an average year here at Paultons Park in Hampshire. It was full of highs and lows, with the weather as usual playing a part, which resulted in birds coming into condition in February and going out of condition again in March, when the weather changed.

We started off the year having our pair of Green-winged Macaws *Ara chloroptera* stolen. Luckily the police managed to retrieve the pair following a tip-off but, unfortunately, the male has had some serious health problems ever since.

Our group of Pink-backed Pelicans *Pelecanus rufescens* went into its winter breeding quarters again in October 2010, but for some reason none of the six eggs which were laid were fertile. This was even after we borrowed two extra males from Longleat Safari Park. The previous year the group produced two young.

A new pair of Von der Decken's Hornbills *Tockus deckeni* was collected from Colchester Zoo in February. The pair was placed in quarantine and a nest box with a camera inside was put in with the pair just on the off-chance something might happen. This proved to be the case and, by April 11th, the female was completely walled-in and being fed by the male. On April 16th the camera revealed that one egg had been laid and on April 25th a second egg was seen in the nest. Regrettably, a few weeks later on May 15th, the female broke out of the nest and no sign of the eggs could be found. The pair was transferred to an outside aviary on June 1st.

Our pair of Violet Turacos *Musophaga violacea* in the large mixed Garden Aviary again did us proud by producing six parent-reared young. In addition, very late in the year when the weather was beginning to turn, in an attempt to stop the pair from nesting again, the pair's two eggs were removed and placed in an incubator and one chick was hatched and hand-reared. Unfortunately, removing the eggs failed to discourage the female from laying again and she went on to produce a further two healthy youngsters, making an overall total of seven young for the year.

The pair of White-throated Magpie-Jays *Calocitta f. formosa* produced two chicks which hatched on May 15th and luckily turned out to be one of each sex. Our young male was paired with a young female from Phil Lewis on the Isle of Wight and sent to Raymond Sawyer at Cobham.

For the first time the Scarlet Ibis *Eudocimus ruber* produced fertile eggs and two chicks were hatched by the same pair. They grew well for the first

10 days, but then the pair nesting next to them decided to take over their nest one night and built a new nest on top of the chicks, which were found buried beneath the new nest the next morning. This year the first clutch of eggs will be removed and artificially incubated. The number of Scarlet Ibis appear to be dwindling here in the UK.

On March 23rd, we found that the Turkey Vultures *Cathartes aura* had two eggs in their nest chamber, which the pair was taking turns to incubate. Only one chick was produced, but even for this one bird, we spent a great deal of time collecting sufficient road kill to ensure that a healthy youngster finally emerged. Once it was fully independent it was sent to join the demonstration team at the Hawk Conservancy at Andover.

A number of birds either attempted to breed, laid eggs which did not hatch, or their chicks failed to survive. These included: Greater Necklaced Laughingthrush *Garrulax p. pectoralis*, White-throated Laughingthrush *G. albogularis*, Humboldt Penguin *Spheniscus humboldti*, Blue-and-yellow Macaw *Ara ararauna*, Red-crested Turaco *Tauraco erythrolophus* and Black-casqued Wattled Hornbill *Ceratogymna atrata*.

Birds bred during 2011

1 Luzon Bleeding-heart *Gallicolumba luzonica*
2 Laughing Kookaburras *Dacelo novaeguineae*
7 Violet Turacos *Musophaga violacea*
5 White-cheeked Turacos *Tauraco leucotis*
3 Hahn's Macaws *Diopsittaca n. nobilis*
2 White-throated Magpie-Jays *Calocitta f. formosa*
1 Turkey Vulture *Cathartes aura*
1 Southern Screamer *Chauna torquata*
2 Sacred Ibis *Threskiornis aethiopicus*
3 Ringed Teal *Callonetta leucophrys*
4 Pagoda Starlings *Sturnus pagodarum*
4 Mountain Bamboo Partridges *Bambusicola fytchii*
4 Chinese Bamboo Partridges *Bambusicola thoracicus*
3 Speckled Mousebirds *Colius striatus*

New arrivals during 2011

1 Blue-crowned Laughingthrush *Dryonastes courtoisi*
2 Sun Conures *Aratinga solstitialis*
1 Blue-and-yellow Macaw *Ara ararauna*
5 Humboldt Penguins *Spheniscus humboldti*
2 Temminck's Tragopans *Tragopan temminckii*
6 Helmeted Guineafowl *Numida meleagris*

1 Brown-breasted Barbet *Lybius melanopterus*
1 Luzon Bleeding-heart *Gallicolumba luzonica*
2 Timor Zebra Finches *Tæniopygia g. guttata*
2 Red-winged Starlings *Onychognathus morio*
1 Greater Rhea *Rhea americana*

Departures during 2011
3 Pagoda Starlings *Sturnus pagodarum*
7 Violet Turacos *Musophaga violacea*
1 Southern Screamer *Chauna torquata*
1 White-bellied Go-away Bird *Corythaixoides leucogaster*
1 Southern Pied Hornbill *Anthracoceros albirostris convexus*
1 Javan Hill Mynah *Gracula r. religiosa*
1 Black-casqued Wattled Hornbill *Ceratogymna atrata*
1 Blue-and-yellow Macaw *Ara ararauna*
4 Mountain Bamboo Partridges *Bambusicola fytchii*
4 Chinese Bamboo Partridges *Bambusicola thoracicus*

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BELIEVED TO BE A WORLD FIRST

World of Birds Wildlife Sanctuary, Hout Bay, near Cape Town, believes it is probably the first zoological institution in the world to succeed in breeding the African Black Oystercatcher *Haematopus moquini*. One of the parents which has been there for more than 18 years, paired with a two or three years old bird. Two eggs were laid in January (the peak of the holiday season in South Africa) next to the path everybody walks along. Although the female sat most of the time, because of the risk of the eggs being taken or broken, they were removed and placed in an incubator. One of the eggs hatched and the chick was reared by staff at the sanctuary.

LONG-LIVED LORIES

by Rosemary Low

Like most medium-sized parrots, lories and lorikeets have the potential to be long-lived. One reason why there are so few documented records of their longevity in captivity is because few people are so committed to lories that they keep a bird until the end of its life. Because keeping the accommodation of these liquid-feeding birds clean takes up a lot of time, they are more time-consuming to look after than other parrots. However, the rewards of keeping these colourful, active, intelligent and cheeky parrots fully compensate for the necessity to feed them at least twice a day and to keep their perches and accommodation thoroughly clean.

As with other parrots, few owners keep records and usually the only evidence regarding their longevity is anecdotal. This is almost invariably greatly exaggerated, as in the case of "Winston Churchill's macaw." Several years ago the claim was made that it was 100 years old. However, the bird claimed to have become a centenarian was a Blue-and-yellow Macaw *Ara ararauna* and was not even the same species that Churchill had kept, which was a Scarlet Macaw *A. macao*. The fact is that large parrots very rarely, if ever, live beyond their late sixties. Medium-sized parrots may live to be 40 years of age.

I have kept record cards for individual parrots since the 1960s. I know, therefore, that my oldest bird is a Yellow-streaked Lory *Chalcopsitta sintillata* acquired in December 1975 and that he has been with me for more than 35 years. Four years ago he became afraid of his mate of the previous 12 years, so I gave her to Paradise Park at Hayle, in Cornwall, and pensioned him off. He was moved to my outdoor birdroom with access to an outdoor cage in good weather. I should emphasise that old birds feel the cold and need a heat lamp to ease them through the UK winter. For the past four years an infrared ceramic bulb (in a reflective holder) was kept on day and night and at night he always perched close to it. One of three tubular heaters in the birdroom was behind his cage but this did not provide adequate heating for him.

Last summer he showed increased signs of ageing. He was no longer able to fly or to grip strongly with his feet and it was evident that his wings and feet were affected by arthritis. As the November days became colder I watched over him and became increasingly worried and, finally, just before the big freeze commenced, I brought him into the house. As the freeze got worse and, despite the tubular heaters, the temperature in the birdroom dropped below freezing, I knew I had taken the right decision. He would

never have survived out in the birdroom.

This Yellow-streaked Lory has now become, by a year, my longest-lived lory. The previous record was held by a female Duivenbode's Lory *C. duivenbodei* acquired in October 1973. She died 34 years later, in August 2007, when she had two eight week old chicks in the nest. I mention this to show that lories can not only live a long time but that some birds can breed right up until the end of their lives. This female bred with the same male from 1982 to her death, that is, for 25 years. It was the most wonderful pair of birds I ever kept.

I would suggest that lory longevity depends mainly on them being fed the correct diet (some commercial lory foods are only suitable for *Trichoglossus* spp.) and good management. I never let my lories sleep in the outside part of the aviary at night. Too many parrots die as a result of being frightened at night or from being attacked by nocturnal predators.

I also had a long-lived pair of Dusky Lories *Pseudeos fuscata*. The pair was imported from Singapore by a friend in 1973. I remember how thrilled I was to have the pair for the species was then rare in aviculture. (Alas, the species is again rare in Europe.) The male of this prolific breeding pair lived to at least 29 years of age and died in December 2002, having outlived the female by about one year.

Two species of lorikeets which have proved to be long-lived with me are the Iris *Psitteuteles iris* and Musschenbroek's Lorikeet *Neopsittacus musschenbroekii*. Last year my previous record for the Iris Lorikeet, of 22 years, was broken by a female who lived for one year longer. Interestingly, when she died there was nothing about her appearance to suggest that she was old. The oldest male to produce a young one was 17 years of age. The age of 23 years had also been attained by a male Musschenbroek's Lorikeet when I gave him to a friend who had a female. This bird fertilized an egg some months later but, alas, is probably now too old to produce offspring.

Perhaps the most commonly kept lorikeet is the Rainbow *Trichoglossus haematodus moluccanus*. Ten years ago when I visited Hans Walser, a very skilled lory breeder in Switzerland, he showed me a Rainbow Lorikeet that was 26 years of age and in excellent condition. It had flown at liberty for 20 years until the female disappeared. In 2001, when I visited my Swedish friends Inge and Nancy Forsberg they had several Rainbow Lorikeets in their mid-twenties, including the bird shown on the front cover of my book *Lories and Lorikeets* published by Paul Elek in 1977. The *Trichoglossus* spp. are among the toughest of the lorikeets and the least sensitive to incorrect feeding and poorly formulated commercial lory foods.

To sum up: if your lorikeets are not living into their early twenties and your lories into their late twenties, there might be something wrong with your management.

THE HAND-REARING OF THREE DUSKY LORY *Pseudeos fascata* CHICKS AT WELTVOGELPARK WALSRODE

by Wolfgang Magnus, Janina Gerbatsch and Anne Hoppmann

The Dusky Lory *Pseudeos fascata* is found on the island of New Guinea and on nearby Japen Island and the island of Salawati. It inhabits rainforest up to 2,400m (approx. 7,875ft), but can also be seen in suburban parks and occasionally even in plantations and on the savannah. It is a highly gregarious species and sometimes forms roosts of several thousand birds. Like other species of lories, it feeds mainly on nectar and also takes pollen, coconut blossoms and feeds on fruits such as mangos.

Weltvogelpark Walsrode

Dusky Lory chicks at four weeks old.

In the wild, the offspring are reared in hollows in tall, montane trees. Normally two white eggs are laid between November-April, which are incubated for 24 days. The young fledge after about 70 days. On the Red List of Threatened Species the Dusky Lory is considered to be of Least Concern.

In Germany it can be found in a few zoological institutions. It can be distinguished from the many colourful species of lories by its reddish-brown plumage and creamy to white lower back and rump. For most of the time the

Weltvogelpark Walsrode

Five weeks old.

latter are hidden by the wings and are seen only by the most patient visitors, when the birds are flying or during courtship.

Weltvogelpark Walsrode houses a breeding pair of this species in an enclosure in the Lory Atrium. The pair is extremely territorial and the nest box is vehemently defended. The female regularly lays a clutch of two eggs in the nest box and, although the eggs have a high rate of fertilty, the pair had failed to rear any of the young, which either vanished shortly after hatching or were found dead in or outside the nest box.

Therefore, in 2011 it was decided to remove the young and hand-rear them. Three chicks were hand-reared. The first two, which were hatched by the parents in the nest box at the end of May, were removed at approximately two days old and transferred to the hand-rearing section. The chicks were very small and the pink coloured skin was covered with white fluffy down and the eyes were still closed. The chicks weighed about 5g. They were placed in a heated rearing box in which, during the first six days, the temperature was maintained at 37.1°C (98.8°F) with 65% humidity. Both chicks still had food remaining in their crop from the first feeds they had been given by their parents, so were at first given only fluids (Ringer's solution) and lactobacilli.

Weltvogelpark Walsrode

The breeding pair of Dusky Lories.

The chicks were initially fed five to six times a day. They received a 1:1 mixture of a powder especially developed for lories and A19 High Energy powder made into a mush to which was added lactobacilli and dextrose. Within one week the weight of the chicks had increased from 5g to 14.5g. The number of feeds was reduced to four or five a day, depending on how quickly the young digested the food. On day six the temperature in the rearing box was reduced to 36.9°C (98.4°F) and during the following days was reduced step by step 0.1°C (0.18°F) at a time. An experienced keeper controlled the temperature and ensured the well-being of the young lories.

As they were developing well and steadily gaining weight, from mid-June onwards the number of feeds was reduced to three a day. At this stage the food mixture was changed to a 2:1 ratio, that is two parts lory powder to one part A19 High Energy. At three weeks of age, the young lories weighed about 50g and, in addition to the daily feeds, were feeding by themselves from a dish of food placed in the rearing cage. After six weeks they weighed 110g and fledged at about 70 days.

After the parents had incubated the second clutch of eggs for a short time, the eggs were removed from the nest box and transferred to an incubator. The temperature was set at 37.2°C (99.0°F) and the humidity at 55%. Only one of the eggs was fertile. The newly-hatched chick was fed for the first time during the following 24 hours, to ensure that it had enough energy to start its life. Following the successful rearing of the first two young, we experienced no problems rearing the third young lory.

Product mentioned in the text

Nutribird A19 High Energy Parrot Hand-Rearing Food: Versele-Laga nv, Kappellestraat 70, 9800 Deinze, Belgium. Website:www.versele-laga.com

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Weltvogelpark Walsrode opened in 1962 and this year is celebrating its 50th Anniversary. Website:www.weltvogelpark.de/E-mail:anne.hoppmann@weltvogelpark.de

THE ARTIFICIAL INCUBATION OF THE EGGS AND THE HAND-REARING OF THE CHICKS OF THE CAPUCHINBIRD *Perissocephalus tricolor* AT DALLAS WORLD AQUARIUM

by Carolina M. Arruda

The Capuchinbird *Perissocephalus tricolor* is a member of the family Cotingidae (Cotingas) and is placed in the monotypic genus *Perissocephalus*. It is a monomorphic species found in humid forests in north-east South America, where it eats mainly fruits and large insects. In this article, I discuss the incubation of four Capuchinbird eggs and the hand-rearing of the four chicks at Dallas World Aquarium in 2011.

Incubation and hatching

The eggs were laid in an exhibit housing two male and one female Capuchinbirds. The eggs were laid, one per clutch, between February and July. Because the birds had a tendency to break the eggs, the eggs were removed and placed in an incubator. They were incubated at a temperature of 99°F (37.2°C) and 54%-56% humidity. The incubation period varied from 26-27 days. Prior to hatching, the eggs were moved to a hatcher set at 97°F (36.1°C) and 70% humidity, in which the chicks remained until they were fully dry. A small rubber mat in their bowl gave the chicks something to grab hold of with their feet and made them more comfortable, and proved to be very efficient in avoiding foot and leg problems, such as malformations of the bones, as the chicks grew.

Feeding and housing

Their initial diet, until the first few faeces had been passed, consisted mainly of soaked pellets. Sound stimulation was used to obtain the feeding response. Capuchinbird chicks pass faeces immediately after the first beakful of food at every feed, at which time their weight was determined and recorded (see Fig.1).

In order to provide heat until the chicks were able to thermoregulate, they were kept in a brooder. Temperature and humidity parameters are shown in Table 1. At approximately one month of age, perches were provided inside the brooder and chicks were moved to a larger cage after that.

Days one to seven the chicks were fed every two hours; days eight to 14 they were fed every three hours and, from then on, were fed ad lib. Their daily food intake is shown in Table 2.

Newly-hatched chick.

Two weeks old.

One month old.

Fig. 1. Growth rates of Capuchinbird chicks determined immediately after the first beakful of food at every feed.

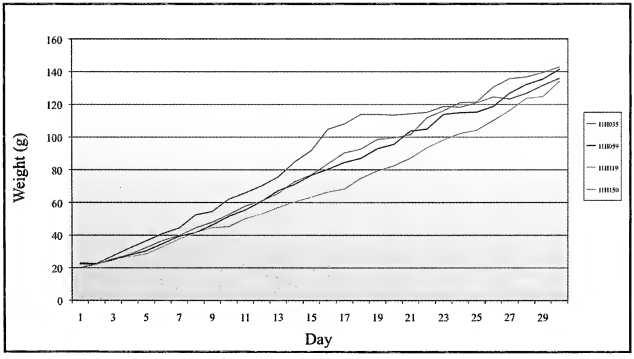

Table 1. Brooder parameters according to the age of the chicks.

Days	Temperature	Humidity
1-3	94°F-92°F (34.4°C-33.3°C)	65%
4-6	90°F-88°F (32.2°C-31.1°C)	60%
7-15	86°F-84°F (30°C-28.9°C)	

After this each chick was kept at room temperature and the door of the brooder was replaced with an open front in order to provide better air circulation.

At each feed they received a portion of pellets, a portion of fruit and a small amount of protein. Mazuri Low Iron Pellets were soaked in a drinking water/apple cider vinegar solution (5ml of vinegar per 250ml of water); the fruit included chopped papaya and blueberries, with chopped waxworms, butterworms and pinkies providing the protein. The protein intake was gradually decreased as the young Capuchinbirds began eating on their own. They learned to do this when they were about one-and-a-half months old. This was done by simply offering them a bowl of food with their favourite items on top.

Table 2. Percentage of daily food intake in comparison to body weight (first weight of the day) spread throughout daily feeds.

Day	Intake
1	20%-25%
2	25%-30%
3	30%-35% and so on

After two weeks each bird received at least 40% of its body weight per day, fed ad lib and not force fed.

Acknowledgements

Special thanks to Daryl Richardson, founder and Director of The Dallas World Aquarium, without whose successful breeding and conservation programmes we would not be able to work with this and many other incredible species. Special thanks also to other members of the Nursery Staff, namely Susan Schmidt, Nikki Gomas and Breanna Cestari, for their great team work raising so many young birds.

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BREEDING THE BLUE-CROWNED MOTMOT *Momotus momota* IN FRANCE

by Patrick Chartier and Cédric Libert

The Blue-crowned Motmot is a medium-sized arboreal bird living in Central and South America, where it can be found in many different habitats, ranging from tropical rainforests to arid regions. It measures 38cm-43cm (15in-17in) in length and weighs from 50g-160g (*M. m. exiguus*, for example, weighs 77g-102g and *M. m. momota* 120g-160g). Twenty subspecies are recognised based on size and plumage variations, but can also differ in their vocalisations. This has led numerous authorities to call for a taxonomic revision of the species. Molecular genetic studies may provide justification for giving full species status to some current subspecies, especially *M. m. bahamensis* which has long been isolated on the islands of Trinidad and Tobago.

The specimens which one of the authors (P.C.) owns were obtained from the Netherlands, having been imported originally from Ecuador. Our contact for exportation from Ecuador was an Ecuadorian veterinarian, well-known for his knowledge of birds and the birds reached us in perfect condition,

I sent Dr D. W. Snow at The Natural History Museum at Tring photos of each of my specimens and, in answer to my inquiry concerning the identification of subspecies, he stated that it is virtually impossible to accurately identify them as individual variation within each subspecies is so great. One of my specimens has much more rufous on the breast and belly and another has a reddish spot behind the crown.

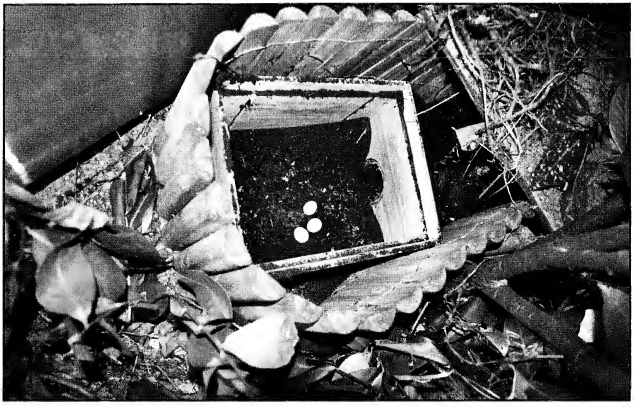
Description

A predominantly green bird with a blue edged black crown and a long tail with the two central rectrices adorned with the characteristic racket-shaped tips. It has a slightly curved bill with serrations along most of the length of the cutting edges of both mandibles. The plumage of the sexes is identical but slight sexual dimorphism, such as differences in bill size and head width, etc., can be observed in Coraciiformes. Males are generally larger and weigh more, but the most reliable criteria is the length of the tarsus, which is usually longer in the case of the male and easily measurable. Both sexes of the nominate subspecies have a black crown, edged with turquoise, blue and violet. A black mask runs through the red eye and terminates in a thin line, bordered above and below with turquoise. The nape is reddish and the back is green. The breast and belly are green, often more-or-less tinged with cinnamon, depending on the subspecies. There are two black spots

Entrance to the artificial nest burrow. The stone was placed on the right-hand side of the entrance to stop the birds from digging a new entrance by the side of the original entrance the width of which it should be noted, is greater than the height.

on the breast. The tail is composed of twelve rectrices, two of which have black-edged violet-blue racket-like tips, which are not always symmetrical. The so-called rackets are often wider than the actual rectrices. Apparently, motmots use their racket-like tail feathers, which they swing pendulum-like from side to side, to send out signals or as a sign of their mood, and I have often witnessed this in captivity when a bird seems alarmed by an unusual presence (Chartier pers. obs.). The legs and feet are black and typical of birds of the order Coraciiformes, have the outer toe fused to the middle toe for most of its length. They have forest-bird type, short, rounded wings, and are not great fliers. They make quick, brief flights, and show remarkable agility when moving through dense vegetation.

On leaving the nest hole, the juveniles are almost the same size as the adults, but are a little slimmer in build. Their coloration, especially the coloration of the green parts, is duller and the black areas are less extensive and they lack the two black spots on the breast and the two central rectrices, which are already longer and wider, are also differently coloured to the others. The racket-like tips are not acquired until after the first moult. These special adornments are, according to some authors, acquired as a result of the birds removing the barbs of the subterminal sections of the two central rectrices. This seems perfectly feasible to me (P. C.), although I have never succeeded in witnessing it happening.



Nest chamber with the top removed to show the clutch of three white eggs.

The back of the nesting chamber.

Voice

This species is usually silent and inconspicuous and moves about mostly when hunting for food. The vocalizations consist of a deep and soft, far-carrying, double "hoot", which can also be translated as "whoo-hoop" or "hoot-hoot". (The name motmot is said to come from the call, in this instance translated as "moat-moat".) At my (P. C's) home in Pays Basque, south-western France, it could be heard from May, mostly at sunrise and sunset, prior to breeding commencing. The male gives a double "hoot-hoot" and the

female answers with a single "hoot-hoot". This is accompanied by a breeding display involving the male presenting twigs and leaves to the female, none of which were found in the nesting chamber after the young fledged.

Habitat

Seasonally or permanently humid tropical rainforest, arid and semi-arid areas, as well as montane areas up to 2,000m (approx. 6,500ft). Also gardens and cultivated areas, close to human activity. It usually favours areas with banks and gentle slopes and along roadsides. It has the most adaptable habitat requirements of all the Momotidae. It enjoys dust-bathing and rain-bathing.

Feeding

It takes a great variety of different foods for a Coraciiformes. Any appropriate-sized insect or invertebrate is swallowed whole. It hunts from a perch or by probing around on the ground, turning over leaves and twigs and digging in the earth to find snails, earthworms, frogs (including the highly toxic poison dart frogs, such as *Dendrobates auratus* in Costa Rica), reptiles (snakes and lizards), scorpions, the chicks of small birds, and mammals. It often dives down onto its prey from a perch on which it had been sitting motionless and kills the prey by beating it on the ground or returns to the perch with it and beats it against the branch. Fruits, including those of palms, along with figs, also constitute a high proportion of the bird's diet. No seeds have been found amongst the stomach contents. It is thought that the chicks are fed on a similar diet to that described above, but that items of food are, at the beginning, usually dismembered by the parents, before being fed to the nestlings. Later, the nestlings swallow the food whole. No fruits are given to them during the first two weeks.

Breeding

It nests in a burrow excavated in a bank of earth or the bank of a river, including sometimes at archeological sites. The burrow consists of a tunnel 0.6m-5m (approx. 2ft-16ft) in length and with an oval-shaped entrance (the width being greater than the height), which is characteristic of this species and easily distinguishes it from burrows dug by other birds and mammals. The tunnel is not always straight and may turn at an angle of up to ninety degrees, depending on obstacles met during the digging process. The entrance is usually inconspicuous and hidden by fallen leaves and other debris. Areas with tree roots are often favoured as they offer better possiblities for concealing the entrance of the nest. Both sexes excavate the tunnel, digging rapidly using both feet alternatively and kicking the earth

backwards. Construction can take several weeks and usually commences up to a few months before the start of the breeding season, which in the wild is usually in September or October, at the end of the rainy season. Breeding occurs during the dry season some four or five months later, once the soil has become harder. Burrows are almost never used for a second time and only for breeding purposes, an exception being *M. m. bahamensis*, which has been seen roosting in its burrow at night. A burrow which is currently in use can be recognised by the two parallel grooves left in the earth by the bird's legs and feet. Usually two to five oval-shaped white eggs are laid, which is typical of hole-nesting Coraciiformes. Incubation, which is undertaken by both the male and female, commences following the laying of the last egg. The incubation period is usually 21 days. The last egg hatches 24 hours after the first egg. The nestlings are born naked. The flight feather quills usually begin to appear after nine days.

Both parents take an equal share of the feeding duties. Skutch noted that the Turquoise-browed Motmot *Eumomota superciliosa* and the Broad-billed Motmot *Electron platyrhynclum* basically have no nest sanitation and the floor of the nest chamber is often covered with the remains of all kinds of larvae and droppings. In the case of our captive Blue-crowned Motmots, we can testify that the nest chamber remained perfectly clean until the juveniles finally fledged, which is very surprising for a Coraciiformes.

The chicks usually remain in the nest for up to 32 days. Usually only a single clutch of eggs is laid each year, but Snow recorded replacement clutches being laid usually 21 days later, which is something we have never observed.

Captivity

The Blue-crowned Motmot was bred at Winged World in 1970 (see *Avicultural Magazine* Vol.76, No.5, pp.188-189 (1970)) and at Kilverstone Wildlife Park, also in the UK, for the first time in 1985, with a total of 13 young being reared over a period of four years (see Vol.97, No.1, pp.38-40 (1991)). Since then private breeders - particularly Gérald Morisseau in France - and some zoos have succeeded in breeding this species in Europe. On January 1st 2011, the ISIS database listed six males and 16 females in Europe, with only one breeding success having been recorded during the previous 12 months. This occurred at Parc Zoologique de Montpellier, which also seems to have been the only zoo to have bred this species in 2009. This species has apparently become extremely rare in private collections. The situation looks better in the USA, with a captive population of 58 males, 60 females, 16 specimens of unknown sex and 22 young produced in 2010.

Four days old. The third chick has died.

Aviary structure and landscaping

Each pair in my private collection was housed singly in aviaries measuring 6m long x 2.5m wide x 2.5m high (approx. 19ft 6in long x 8ft wide x 8ft high) with two access doors (one on each side) and a small shelter 2m x 1.5m (approx. 6ft 6in x 5ft) in which the food was placed on metal structures, so that it could not be reached by small rodents. Each aviary was planted with rich and dense vegetation, amongst which the birds disappeared whenever they felt the need to.

Two-thirds of the roof of each aviary was covered with polycarbonate sheeting. The sides of the aviaries were protected with the same material during wintertime. The birds were rather more sensitive to wind and rain, than to low temperatures. However, in the shelters I always used IR and ceramic lamps in order to maintain the temperature above freezing.

The aviaries were covered with 13mm x 13mm (½in x ½in) wire mesh and rather than use a double layer of wire as protection against raptors, I had wires 15cm (approx. 6in) apart loosely attached to the structure and about 40cm (approx. 1ft 4in) clear of the aviaries, to deter raptors without injuring them.

The ground was covered with sand, which was regularly raked over. Most of the ground vegetation was left in the aviary, except for under the perches, from where it was removed in order to make cleaning a good deal easier.

The breeding pair at Parc Zoologique de Montpellier, consisting of my (P. C's) breeding male and a female hatched at Zürich Zoo, has since the summer of 2007 been exhibited in an aviary of similar dimensions to that

Eight days old.

Twelve days old.

described above. The aviary is in the Amazonian Tropical Hall, in which the temperature hardly ever varies and, therefore, there is no need for a shelter. A small, but very leafy tree *Gustavia gracilima*, has been planted in the aviary and the birds often shelter or hide among the foliage of this tree if they feel

at all stressed. Most of the top of the aviary is covered by a climber/vine *Aristolochia* sp. and at the back there is a wall, which provides the birds with a peaceful area in which to rest, when there are lots of visitors to the Tropical Hall. Five or six times a day fine sprays of water are directed towards the back of the exhibit, but without soaking the aviary itself.

Behaviour

In captivity these birds remain physically and mentally healthy so long as they can keep their distance and hide away from visitors whenever they feel the need to. Rather than take fright and crash against the wire, they prefer to quickly slip away into dense vegetation, showing how well this species is adapted to forest habitat.

During the first few weeks after fledging, juveniles are very nervous and great care must be taken when approaching them and they should always be given sufficient time to quietly slip away.

I (P. C.) have kept mostly males in my breeding station and have succeeded in keeping young males together in a single aviary without witnessing any aggressive behaviour. I kept two brothers together in the same aviary for three years without any problems. I must stress, of course, that there were no females in the aviaries or nearby.

Juveniles become independent fairly rapidly and the females were usually separated from their parents after eight weeks.

I (P. C.) do not know how this species would behave if housed in a mixed species exhibit, as I have always housed my breeding pairs separately in order to avoid any trouble which might lead to the failure of a breeding attempt, which I suspect might happen unless they are housed in an especially large exhibit. Observations at Parc Zoologique de Montpellier show that when young males reach four months of age, tensions begin to surface between them and their father, leading to concern over the safety of the young males.

Feeding

They are mostly given suitable livefood, as well as various different kinds of fruit (see Table 1). I (P. C.) personally favour whole cherries and fruits such as blueberries and elderberries, etc., which deteriorate less rapidly. Nutribird T16, a low iron complete maintenance and breeding food specially formulated for toucans, turacos and other fruit-eating birds, is also provided, but the birds do not usually eat much of this. Other softbill foods may be accepted in time, but may have to be moistened, which is likely to cause them to deteriorate in quality fairly quickly. Insectivorous mixtures, if given alone, usually prove to be unsuitable, as the birds often

toss them about looking for cherries and other fruits, and make a mess in the aviary. Pieces of meat, mice and quail chicks (always dead of course) are also given. In my outside aviaries, I hardly ever found lizards and the mouse traps were usually empty, which was probably a sign of opportunistic predation by the birds.

The mouse traps were the small mechanical type which I kept in place permanently. I never used poison in and around my aviaries, as I felt there was a risk of the motmots eating rodents that had ingested the poison. My concern though may have been misplaced, as Eric Bureau, veterinarian and Deputy Director of Parc de Oiseaux Villars les Dombes and my co-author (C. L.), have confirmed that using poison as a means of pest control is not a major issue, as it has usually been completely metabolised by the liver by the time the animal dies. Prophylactic treatment with vitamin K is always possible. What must be avoided, however, is a massive pest control effort which generates large quantities of dead rodents.

It is essential to dust the above diet with a good vitamin/mineral supplement daily throughout the breeding season and on a regular basis outside of the breeding season (I (P. C.) used Quiko Forte).

The birds are fed twice a day. Half of fresh fruit, vegetables and proteins in the morning and the remainder in the afternoon.

Table 1. Typical daily diet for each motmot at Parc Zoologique de Montpellier.

Ingredients	Preparation
T16 low iron pellets	Available at all times
10g Apples/pears	Cut into small cubes
10g Banana	Cut into small cubes
10g Carrots	Cut into small cubes
10g Melon/grapes/figs/peaches cherries (during summer)	Cut into small cubes
10g Insectivore patee	Placed on fruit
5 Pieces of dog food with maximum iron content of 150ppm	Soaked in tea overnight
1 Day old mouse (pinkie)	Previously fed on reptile
2-3 Morio worms and mealworms	croquettes/pellets (manufactured specially for reptiles)
2-3 Locusts and crickets	in order to achieve the correct calcium to phosphorus ratio

Vitamin/mineral supplement: a small amount of Olivitasol on the tip of a knife each day for the first 10 days of each month.

Diseases

Motmots are very resistant to pathogens and very few publications are available on specifically motmot-related diseases. In 2007, however, a specific parasite *Circumvitellatrema motmota was* described, first from Audubon Zoo and then from other zoological institutions in the USA. This parasite, which is confined to motmots, develops in snails and passes to the bird when the bird eats the snails. The larvae migrate to the bird's air sacs where they can develop into 5mm long parasites. Up to 50 of these can be found in the air sacs of a single bird and, one can easily imagine, how this must affect the bird.

In the autumn (fall) of 2010, this parasite was identified in a young motmot hatched at Parc Zoologique de Montpellier, showing that this parasite is capable of completing its life cycle here in Europe. The hypothesis we came up with is that the male parent, although he appeared perfectly healthy, was probably carrying the parasite when he was imported from Ecuador. The parasite had then completed its development in the small snails living in the aviary, which is similar to what happened in the USA. Drugs such as Prazinquantel (at five times higher than the usual dose), which are used in the USA, did not provide very satisfactory results. Infected birds can, however, live to a fairly old age, so long as they are maintained in good conditions. The main problem is that young birds can become infected through their parents excreting the parasite's eggs in their saliva and faeces. So far, the only solution seems to be to remove the eggs for artificial incubation and hand-rear the chicks.

Parasites such as coccidia, giardia and capillaria are frequently encountered. Avian tuberculosis *Mycobacterium avium*, which is known to cause important losses in captive populations of passerines, is also known to affect motmots. Other diseases such as aspergillosis, yersiniosis and chlamydophilosis can have a negative effect on these birds. *E. coli* is mostly found in very sick birds suffering from terminal septicemia. Hypovitaminosis A, which can occur due to a lack of whole prey items in the diet (vitamin A being stored in the liver), emphasises the importance of using a good vitamin/mineral supplement.

The effects of hemosiderosis (iron storage disease) are well known. Therefore, we feed our birds low iron pellets and dog food which has been soaked in tea, relying on the tannin in the tea to limit iron absorption. Fruits with a high vitamin C content should be fed to birds only sparingly, as ascorbic acid is known to aid iron absorption. Osteodystrophia, which can lead to broken bones or the excessive mineralization of the bones, can occur if there is an imbalance of calcium and phosphorus in the diet. It is important, therefore, to feed the birds whole prey items rather than just meat and to feed them livefood which has previously been fed on, for example,

Juvenile two weeks after emerging from the burrow. The bird already has the two black spots on the breast.

reptile croquettes/pellets in order to achieve a good ratio of calcium to phosphorus.

Foods with a high fat content and other foods which may lead to obesity should be avoided.

Breeding

I (P. C.) created a nesting burrow in my aviary, which the birds had no choice but to use, as I had placed wire mesh beneath the sandy soil most of which was sheltered from the rain and was, therefore, also very hard.

The burrow was basically a 10cm (4in) diameter cardboard tube filled with a mixture of peat and sand, which was attached to the nest chamber - a wooden box which had originally held 12 bottles of wine - with a substrate consisting of a mixture of compost and sand. The entire structure was then boxed-in and coated with an adhesive, to which sand, earth, leaves and branches were attached in order to give it a more naturalistic appearance. It was then placed beneath a small tree.

By using such a structure, the nest chamber can easily be checked to determine what is happening and, at the appropriate time, the chicks can be ringed (banded). I never had any problems ringing (banding) the birds, but did take the precaution of putting a black or brown covering on the rings (bands) at the beginning.

At Parc Zoologique de Montpellier the breeding pair is housed in an exhibit in which the ground is covered with a 40cm (approx. 1ft 4in) deep layer of well packed mulch. The birds have access to an artificial burrow similar to that described above, which the pair sometimes explore and work on after keepers have blocked the entrance by adding earth at the end of the winter. However, in both 2009 and 2010, the pair nested in a burrow which the two birds had excavated themselves. This was approximately 1m (3ft 3in) in length and had an oval-shaped opening which was 14cm (5½in) wide and 12cm (4¾in) high. It was discretely dug by the pair in February but it was not until May that the pair was observed regularly going in and out of it.

Raising the chicks

During the first 12 days only livefood was given. Then we progressively added fruit and berries. Amongst the preferred items of food were day old mice (pinkies), pieces of quail chick, thin slices of heart or other meat, dog food (max. 150ppm of iron, soaked in tea for 24 hours), beetles and mealworms, etc. A single chick can eat up to six one day old mice (pinkies) and a great many morio worms each day during the first two weeks of its life.

Livefood for feeding to the chicks needs to be especially well fed beforehand on a good varied diet that provides as many nutritional elements as possible for the chicks. Mealworms can eat almost anything as soon as their mandibles are able to crush the food items they are given. These can include, as mentioned earlier, reptile croquettes/pellets (manufactured specially for reptiles), which will help achieve a better calcium to phosphorus ratio.

Diary of events in 2005 when the pair used an artificial burrow:

15.06.05. Both birds, working alternatively, began to dig out earth blocking access to the artificial tunnel.
22.06.05. When both birds were visible in the aviary, the nest chamber was checked, but no eggs had been laid.
26.06.05. Female remained in burrow.
28.06.05. On inspecting the nest chamber, three eggs were found (see photo p.65).
29.06.05. Both birds spent an equal amount of time in the nest chamber.
06.07.05. The female barely ever left the nest chamber.
09.07.05. The female was seen again while the male was in the nest chamber.
14.07.05. Three fertile eggs were present in the nest chamber.
16.07.05. Both parents were out in the aviary and continually going back and forth to the nest chamber.
20.07.05. One of the three chicks was found dead in the nest.
24.07.05. The quills of the flight feathers were beginning to appear, but it had not yet been possible to ring (band) the chicks.
27.07.05. It was still not possible to ring (band) the chicks. The nest chamber was very clean.
29.07.05. The two chicks were ringed (banded), afterwhich it was decided not to make any further checks of the nest chamber.
16.08.05. The two juveniles emerged from the nest. They were relatively agile in flight, very similar to their parents. They were easily frightened but given the size of the aviary and the vegetation, this was not a problem as they hid whenever they saw me approaching. They fledged very quickly and were almost independent once they left the nest chamber.

Two weeks after the two juveniles fledged, the adult pair began to moult.

Diary of events in 2010 when the pair used a natural burrow:

04.02.10. Pair dug a new burrow.
27.05.10. Male spent most of the day in the nest chamber. Keepers were told to increase the amount of livefood and not go into the aviary anymore. Feeding was done via a pivoting platform.
30.05.10. Both members of the pair went into the nest chamber together, afterwhich one of them almost always remained in the nest chamber. This is thought to have been the date egg laying commenced.
05.06.10. The male remained in the nest chamber most of the day.
15.06.10. The female remained in the nest chamber most of the day.
19.06.10. The pair was in the nest chamber during the morning, which is thought to have been the hatching date.
22.06.10. The male was seen going into the nest with a morio worm.
12.07.10. The male took morio worms, mealworms and artificial food into the nest.
17.07.10. Two juveniles flew out of the nest hole.
30.11.10. Tension involving young male was observed during feeding.
01.12.10. Juveniles are separated in quarantine.

Conclusion

These birds should be kept only by highly motivated and knowledgeable aviculturists, who have a wide experience of keeping such birds and are able to bring a scientific approach to bird breeding. If these criteria can be met, a good case can be made for allowing the further importation of wild specimens and significant progress made in conserving this species both *in situ* and *ex situ*. Given the very small number of captive birds in Europe, we are actively looking for specimens and aviculturists who currently have or have kept this species in their collection. For details of how to contact us please see below.

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Hon. Editor's Acknowledgements

I would like to thank Pierre de Chabannes for translating the above article from French to English, apart from a few sentences here and there and one particular paragraph on which I received assistance from Gregory Guida, to whom I am also most grateful.

THE SUCCESSFUL BREEDING OF THE SUNBITTERN *Eurypyga h. helias* AT TWYCROSS ZOO

by Christopher Dunn

The Sunbittern *Eurypyga helias* is the sole member of the Central and South American family Eurypygidae. Its closest relative is the Kagu *Rhynochetos jubatus* of New Caledonia, although exactly how these two birds fit in taxonomically with other species remains a matter of dispute.

The Sunbittern inhabits tropical rainforest, where it lives near water and hunts small vertebrate and invertebrate prey. This consists largely of small amphibians, fish, very small mammals and insects/aquatic insect larvae.

Female Sunbittern with a single egg.

It is usually found singly or in pairs. Breeding pairs use mud and plant materials to construct an open nest in a tree, and usually lay one or two mottled eggs, which both birds take turns to incubate and both parents rear the young. The chicks are semi-precocial and hatch out covered in downy feathering and with both eyes open. Although soon capable of moving around within the nest, they remain in the nest until they fledge aged about 16-20 days. They continue to be fed by both parents until they are weaned

at eight to nine weeks of age.

The Sunbittern gets its common name, of course, on account of the sunset-like markings, which are revealed when it spreads its wings. When threatened, Sunbitterns open both wings, which they arch and direct forward towards the perceived threat while hissing. Should the threat persist, they will often flick the wings forward and continue to make clicking/hissing vocalisations in an attempt to intimidate whatever it is that they perceive to be a threat to them. Presumably, the sunset-like markings imitate the eyes of a large predator and are intended to fool other creatures into believing that the Sunbittern is much larger and more ferocious than it actually is. However, in the event of the creature threatening them not backing down, Sunbitterns are relatively harmless and will usually turn tail and fly away. There are apparently no visual differences between the sexes and, currently, the only accurate means of distinguishing between the sexes is by DNA or surgical sexing, or by carefully observing their behaviour.

At Twycross Zoo the Sunbitterns live in the Tropical House, which is a small walk-through mixed species exhibit housing free-roaming Cotton-eared Marmosets *Callithrix jacchus*, Linne's Two-toed Sloth *Choloepus didactylus*, Seba's Short-tailed Bats *Carollia perspicillata*, Roulroul or Crested Wood Partridge *Rollulus rouloul*, Ringed Teal *Callonetta leucophrys*, Striated Heron *Butorides virescens* and Montserrat Oriole *Icterus oberi*. The exhibit imitates a tropical rainforest setting and is planted throughout, although nearly all of the plant growth and cover is at ground level. A sprinkler system directly above the pond creates an artificial thunderstorm, which works on a timer roughly every 15-20 minutes. It runs for a short duration and the birds seem to enjoy the opportunities to bathe which it provides, whereas upon hearing the thunder soundtrack, the marmosets leave the pond area. This may well be why the Sunbitterns have continuously chosen to nest directly above the pond or very nearby as, given the opportunity, the marmosets would steal the eggs or take the chicks. In all previous nesting attempts the Sunbitterns had nested directly above the pond or on the bank. The path which visitors follow goes all of the way around this area, except that the pond forms a barrier near the entrance and a barrier of plants on the opposite side provided sufficient cover/distance for the birds to nest and feel secure. The average relative humidity in the exhibit ranges from 60%-80% and the average spring-autumn temperature is 25°C-27°C (77°F-80.6°F).

The Sunbitterns at Twycross Zoo receive the following diet:

75g Freshwater smelt (defrosted from frozen)
60g Soaked ibis diet
75g Finely chopped fruit (taken from apple, pear, orange, banana, grapes, tomato, sultanas, mixed with Haith's softbill food at a rate

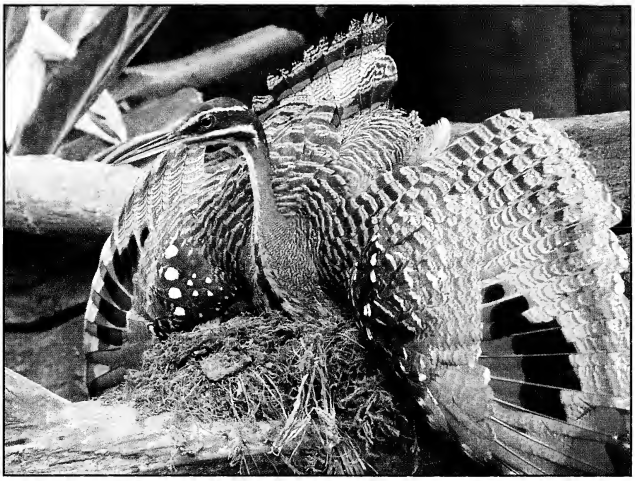
of roughly 750ml softbill food to 2 litres of chopped fruit)
100g Minced (ground) meat diet (taken from approx. 5kg minced (ground) red meat, mixed with 1kg chick crumbs and 1kg Haith's softbill food)
6-8 Pinkie mice (increased to 12 when a chick is present)

The food is then lightly dusted with Mazuri carnivore supplement, before being offered to the birds. Scatter feeds of livefood - crickets, locusts, waxworms and mealworms - dusted with a calcium balancer are offered during the day, with the frequency being increased when chicks are present or breeding behaviour has been observed.

The Sunbitterns appear to ignore the soaked ibis diet and the chopped fruit and feed mainly on whole vertebrate items and some of the minced (ground) meat, along with the scattered livefood. When rearing chicks only livefood and whole vertebrates are offered to the chicks by the parents.

Sunbitterns are believed to take roughly one-and-a-half years to two years to reach sexual maturity. Those at Twycross first started showing signs of breeding behaviour around June/July 2010, following a series of late afternoon/evening displays and vocalisations by the pair. Whether through inexperience or to avoid the marmosets, the first nesting attempts were at ground level on the bank at the rear of the pond. Leaves were collected and placed on the ground at the chosen nest site, however, no eggs were laid and the pair was later discovered to be incubating a large pebble of roughly the same colour and with roughly the same markings as a Sunbittern egg. Such behaviour has been observed in gulls, with nesting birds attempting to incubate large pebbles or artificial eggs with similar coloration and patterning to their own eggs, with the largest 'egg' (object) producing the strongest brooding responses. As a result the pebble was removed to avoid potential problems in the future.

Several months later the pair nested again in the same spot and within a week an egg was laid. However, due to the poorly constructed nest, the egg rolled out and down the bank on several occasions. It came to a stop almost 2ft (0.6m) away and was quickly retrieved and placed back beneath the brooding bird. To everyone's amazement the egg hatched about 30 days later. At this point the marmosets were closed off in their off-show area to avoid any chance of them predating the chick, and remained closed off until after the chick had fledged approximately 18 days later. The chick was more-or-less weaned at about 60 days and was surgically sexed and found to be a male. The young bird remained with its parents for several weeks. When the adults decided to nest again they started to drive it away, but due to the layout of the tropical house and dense ground cover there were plenty of hiding places for it.



Threat display by female Sunbittern while on the nest.

The third nesting attempt was a failure. This time the pair chose a branch overhanging the pond and attempted to build on it, but the nesting materials the pair collected simply fell off the branch. An egg was laid which was found at the bottom of the pond. This was recovered for possible artificial incubation, but was found to have a hairline crack.

By then it had become apparent that the nesting materials available in the tropical house were unsuitable. The soil was largely humus and silt and crumbled and did not therefore bind the nesting materials together. To solve the problem, moss and dry grass/plant fibres were collected from around the site and sterilised in boiling water and Safe4 disinfectant. Some of the nesting material was then lightly rubbed with modelling clay and some was heavily rubbed with modelling clay, so that the birds had a choice. The pair had been observed collecting nesting material from near the water's edge, so the nesting material which had been mixed with clay was scattered loosely around the edge of the pond. Both birds took an immediate interest in this and initially seemed to prefer long fibrous materials. These were collected and placed on a branch in a rough oval shape to construct a base to support the rest of the nest. Once the base had been built up sufficiently, the pair collected more moss, which was placed on top and gently trod in and manipulated with the beak. A lot of nesting material fell into the pond,

Nine days old.

Twelve days old.

but not enough to prevent them from virtually completing the nest within 24 hours. More moss was collected the following day to provide additional material to line the nest.

The fourth breeding attempt was the most successful so far. An egg was laid on June 23rd, which hatched 27 days later on July 20th. The chick developed rapidly and fledged at 16 days old and by eight to nine weeks of age had been weaned onto mealworms and smelt. Furthermore, with the existing nest already in place the interval between clutches was drastically reduced and the fourth egg was laid on October 7th, roughly nine weeks after chick number two had fledged. This further nesting attempt again resulted in the adult pair, especially the male, showing some aggression towards the young Sunbittern. However, this was minimal and amounted to driving the youngster away from the nest site, with the odd lunge towards it, if it landed within 1m (approx. 3ft 3in) or so of the nest site. Oddly, when the male was incubating the egg, the female rarely showed any aggression towards the youngster and, at times, all three Sunbitterns could be seen on the same nesting branch. The fourth egg hatched on November 4th after 28 days incubation. The presence of the chick in the nest did not lead to increased aggression towards the juvenile Sunbittern. In fact the parents showed less interest in the juvenile, as they concentrated on providing food for the growing chick.

Acknowledgements

Special thanks to Tropical House keepers Nick Rowley, Jamie Brown and Paul Round, without whose help we may not have succeeded in successfully breeding these birds.

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BREEDING THE MARABOU STORK *Leptoptilos crumeniferus* AT PAIGNTON ZOO ENVIRONMENTAL PARK

by Peter Smallbones

The Marabou *Leptoptilos crumeniferus* is the largest member of the Ciconiidae family. It stands from 115cm-152cm (approx. 3ft 10in-5ft tall), has a wingspan of 225cm-287cm (approx. 7ft 4in-9ft 4in) and weighs from 4kg-8.9kg (approx. 8lbs 8ozs-19lbs 6ozs). It is found in tropical Africa, where it frequents open savannah, grassland and swamps and is also found around fishing villages and rubbish dumps and abattoirs in towns and cities.

The Marabou's diet consists of various small items of prey such as locusts, snakes, fish and rats. However it is also capable of sometimes taking adult Lesser Flamingos *Phoenicopterus minor* and even Greater Flamingos *P. roseus*. It will also sometimes join vultures at kills. Carrion and waste from the human population often makes up the majority of its diet and its increasing numbers in the wild may be due to its willingness to exploit rubbish dumped by humans.

The Marabou is bred in only a small number of EAZA (European Association of Zoos and Aquaria) collections. The first recorded breeding in the UK was at Blackbrook Zoological Park in 1999, which was described by Malcolm Mycock in the *Avicultural Magazine* Vol. 106, No.4, pp.182-184 (2000). In 2011 it was bred for the first time here at Paignton Zoo Environmental Park.

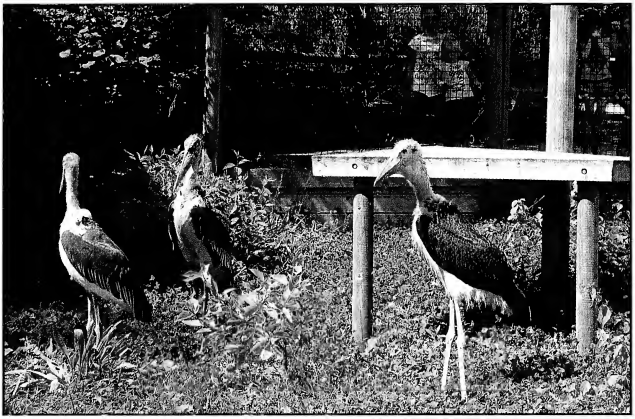
Paignton's group consists of 2.2 Marabous. A male of approximately 26 years of age who was paired with a mature female of unknown age, which first formed a pair bond in 2009 and had been observed mating. A younger mature male of unknown age and a three years of age female make up the group.

The group is housed in a new purpose-built aviary measuring approximately 18m x 16m x 5m high (60ft x 52ft 6in x 16ft 6in high). The roof of the aviary is 10cm (4in) gauge netting and the back of the aviary incorporates part of the zoo's main lake. The aviary has several perches and platforms at different heights which may be important in reducing aggression, as dominant birds usually choose the highest perches. The grass roof of the building (see below) also provides an elevated position on which the birds can perch. Several large logs on the aviary floor provide perches for pinioned birds and a tall evergreen *Lonicera nitida* enables a bird to quickly put a barrier between itself and an aggressor - if necessary.

Seventeen days old.

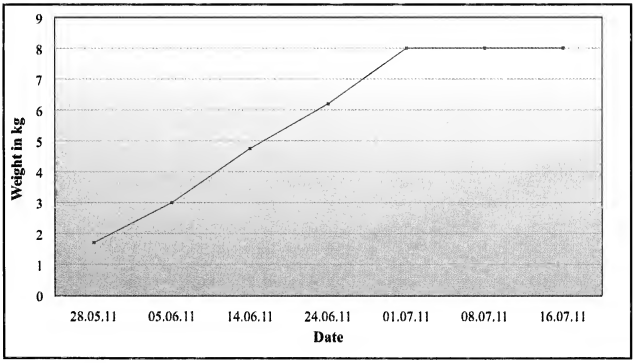
Forty days old.

The grass-roofed building has four doors and four stalls each measuring 2.25m x 2.4m (approx. 7ft 3in x 7ft 9in) divided by double mesh. These dividers can, if need be, be removed to make the stalls larger. The four stalls enable the Marabous to be housed separately at night during cold weather and also enables them to be fed separately. The floor of each stall is covered with wood shavings and has two bales of straw on which the birds roost. The lighting in the building is controlled by a timer so that the birds can



Young Marabou (on the right) at 89 days.

Fig. 1. Growth rate of Marabou chick measured at approximately weekly intervals.



have extra light and, in addition, a heat lamp in each stall provides heating during the winter. Two air vents at the back of the building help ventilate it when the birds are shut in.

Each bird is fed separately and gets half-a-dozen (6) day old, deyolked chicks, 15-20 Sprats *Sprattus sprattus* and two chunks of meat cut into

approximately 4cm x 4cm x 4cm (1½in x 1½in x 1½in) cubes. By feeding the birds separately in the stalls keepers are able monitor their food consumption and prevent a dominant bird from monopolising the choicest items of food. This may also help to keep aggression levels down. Each bird quickly chooses a favoured stall in which to roost and we have very few problems when it comes to shutting them in at night.

The original pair was moved to the new aviary in the autumn (fall) of 2010. Both birds settled in well but at night were housed in separate stalls due to the oncoming cold weather and to get them into a routine. At about the same time, the young male and female were introduced to each other in the zoo's off-show purpose-built stork/crane pairing aviary. This consists of a house divided into two by a mesh divide and with an approximately 16m x 15m x 4m high (52ft 6in x 50ft x 13ft high) outside aviary. The birds were initially kept in separate stalls and allowed out separately. Windows in the building allowed them to have constant visual contact with each other. After a couple of weeks the birds were released together into the outside aviary and monitored by a keeper during the day and housed in separate stalls at night. The slow nature of the introduction seemed to lessen any aggression which might have occurred between the two birds.

At the end of 2010 the new pair was moved to the new on-show aviary but continued to be shut into separate stalls at night. The two pairs of Marabous were then allowed out on alternative days. This enabled the new pair to familiarize itself with the new surroundings at its own pace prior to being introduced to the original pair.

In January 2011 the two pairs were slowly introduced to each other and, although the introduction went well, they continued to be monitored. The young female being the least dominant bird kept her distance from the other three. The two males were, as expected, the dominant birds and would often show slight signs of aggression, when they would occasionally snap at each other, but this was to be expected.

In February 2011, however, the mature female began to show an interest in the younger male and his aggression then increased towards the older male. This aggression continued and the older male, who is pinioned, was unable to manoeuvre quickly enough to stay out of harm's way and, therefore, for his own safety the decision was taken to remove him from the aviary.

The newly dominant male was caught and one wing was clipped slightly to slow him down and allow the females to stay one jump ahead of him as he became increasingly more confident. He and the older female would often bill-clap in unison and make high-pitched squealing calls affirming their partnership. An assortment of different sized sticks were provided as nesting material and, as the night-time temperature was rising, the pair was

allowed to remain together in the aviary throughout the day and night. The young female, however, continued to be shut in her stall at night.

The male and the older female chose the top of the two bales of straw on which to construct a nest measuring 100cm x 80cm x 20cm (approx. 3ft 3in x 2ft 7½in x 8in), to which green leafy material was often added. One of the partitions was removed to allow the pair more space and the following day, April 5th 2011, an egg was laid on the nest. A second egg was recorded on April 9th. Incubation was shared between the sexes, with the male possibly spending slightly more time on the nest during the day. On the afternoon of May 10th a chick was heard calling extremely loudly from inside one of the eggs and, by May 11th, a chick had hatched.

Due to the young female's inquisitive behaviour and because it was uncertain how much hostility would be shown towards her by the pair now that the chick had hatched, the decision was taken on May 14th to remove the young female from the aviary and house her with the original male.

When the chick was first hatched the pair was given chopped Sprats, strips of meat, pinkie mice, strips of filleted Roach *Rutilus rutilus*, chopped and skinned deyolked chicks with the legs and feet removed and chopped whitebait, sprinkled with Witte Molen Calcicare 40+ supplement. Mice fluffs were chopped up and added to the diet as the chick grew bigger and the number of pinkies was reduced and replaced with skinned, crushed mice, with the tail and feet removed. Nestlings cannot caste until approximately 20 days old, which is why the food was skinned, but after that the amount of skin was slowly increased to prevent proventricular impaction.

Two bowls of food were placed in the house at 8.45am each day and a third was placed there at approximately 4.30pm (16.30hrs). As the chick's size increased the amount of food was increased to take account of this. Whitebait, pinkies and mice fluffs were gradually phased out and the amount of meat and mice was increased. Eventually all of the food was fed whole.

Metabolic bone disease is a serious concern when rearing this species. Therefore, as the chick was being reared inside the house, where exposure to sunlight was minimal and it could not be detemined whether the parents were feeding the chick the food to which the supplement had been added and were not washing it off or eating the food themselves, on May 28th when the chick was 17 days old, it was decided to weigh it once a week and hand-feed it each day and also give it Mazuri™ Fish Eater Tablets and a pinch of Nutrobal. It was given the recommended number of tablets according to its weight using the guidelines on the website: www.mazuri.eu The chick was quite feisty and would lunge at keepers during this process.

On the final occasion the chick was weighed, which was on July 16th,

it weighed 8kg (approx. 171bs 6ozs) and was hand-fed fish eater tablets in mice. At the same time six feathers were removed from its breast and sent for DNA sexing. As keepers suspected, on account of the bird's large size, this confirmed that it is a male. Thereafter the young Marabou caught food thrown to it, to which the supplements had been added.

Although the female spent the greater amount of time rearing the chick, both parents were very attentive towards it and both fed it and covered it. Neither parent showed any aggression towards the keepers.

The chick was first seen standing on the nest at 40 days and fledged at 88 days. After having learned valuable social skills from its parents, the young Marabou was removed from the aviary on December 7th 2011 when it was aged 210 days. It was housed in the off-show pairing aviary with the young female. They were, however, separated by a mesh divider. The pairing process was about to begin again and, hopefully, the two will become a second breeding pair.

Acknowledgements

I wish to thank Jo Gregson, Curator of Birds and the bird keeping staff at Paignton, with a special mention for Head Keeper Ian Grant, Rob Peters and Sam Gray, without whose efforts caring for these birds this success would never have been achieved.

Products mentioned in the text

Nutrobal multivitamin powder: Vetark Professional, PO Box 60, Winchester, Hants S023 9XN, UK. Website: www.vetark.co.uk

Mazuri™ Zoo Foods Fish Eater Tablets: Mazuri™ Zoo Foods UK, PO Box 705, Witham, Essex CM8 3TH, UK. E-mail: info@mazurifoods.com/Website:www.mazuri.eu

Witte Molen Calcicare 40+: Witte Molen, Moleneind 2, 4268 Meeuwen, Postbus 25, 4260 A A Wijk en Aalburg, the Netherlands. Website: www.wittemolen.nl

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THE OPENING OF A NEW HUMMINGBIRD BREEDING CENTRE TO MARK THE FIFTIETH ANNIVERSARY OF WELTVOGELPARK WALSRODE

by Anne Hoppmann

At the end of 2011, thanks to the cooperation of a hummingbird breeding centre at Trieste, in Italy, we received two species of hummingbirds for our newly-designed hummingbird breeding centre here at Weltvogelpark Walsrode. At the moment we have the Amazilia Hummingbird *Amazilia amazilia*, which prefers habitats with scrub, xerophytic steppe, thorn forest and desert areas and is also common even in parks and gardens in cities. The male and female closely resemble each other in appearance.

The second species is the Green-tailed Trainbearer *Lesbia nuna*, which like the Amazilia Hummingbird is found in western South America, where it lives in the Andean region at altitudes of up to 3,800m (approx. 12,500ft). The male can be distinguished from the female (which otherwise looks very similar) by his 10cm-12cm (approx. 4in-4¾in) long, forked tail. This species is rarely seen in zoos and in Germany can be seen only at Weltvogelpark Walsrode.

To satisfy the special requirements of these birds, much thought went into planning their housing. It is, for example, kept as sterile as possible, as pathogens can pose a serious danger to hummingbirds. The temperature and lighting are constantly controlled and the water used is specially filtered and a sprinkler system has been adapted to the needs of the humingbirds and helps regulate the humidity. The daytime temperature is maintained at 26°C (78.8°F). This is reduced to 17°C-20°C (62.6°F-68°F) at night. The humidity is maintained at 60%-70%. The lighting is controlled automatically and, to give the birds a good start to the day, shortly after 8.00am the basic lighting is slowly increased and half-an-hour later UV daylight lamps are turned on as well. Twelve hours later, shortly after 8.00pm (20.00hrs), the lighting is gradually reduced over a period of one hour. During the night the enclosures housing the birds are in complete darkness to ensure that the birds get the necessary period of rest.

The birds are cared for all day by dedicated keepers who, because scientific work and documentation are an important part of the work at Weltvogelpark Walsrode, observe and record the behaviour of each bird. The specially formulated nectar, which contains proteins, fats and carbohydrates, plus vitamins, is prepared fresh twice daily. It is given to the birds in free-hanging feeding tubes, which are filled with fresh nectar twice a day. Hummingbirds need to feed on nectar every 45 minutes. During the breeding

season the hummingbirds are also offered fruit flies which they prefer for feeding their offspring.

The breeding enclosures are densely planted and offer numerous hiding places for these very sensitive birds. Fibres from the plants may be used for nest building. In addition, silk and cotton threads are provided as nesting material. It is important that none of the nesting material has been treated with chemicals and that only clean, natural fibres are given to the birds. The nests of the various species can differ a lot - in the wild the Amazilia Hummingbird builds a cup-shaped nest made of plant wool and cobwebs which it places on the upperside of a branch, whereas the nest of the Green-tailed Trainbearer is made of mosses and rootlets and placed beneath an overhang on a slope.

Most hummingbirds are very territorial and males and females are not normally kept together. Some species, such as the Amazilia Hummingbird, seem to be hardier and easier to keep than others. Consequently the Amazilia Hummingbird is kept in some European zoos. The Green-tailed Trainbearer, however, is more delicate and sensitive to changes in its environment. The enclosures in the breeding centre have been designed so that each female has her own enclosure and the males are housed in adjacent areas. The male is only allowed to enter the female's enclosure when she is actively building a nest. Following a successful pairing, the male is immediately separated again and the female is left to concentrate on incubating the eggs and caring for the young.

Following the opening in March 2012, visitors are able to experience the exciting world of hummingbirds as well as visit our *Kolibri-Haus* beneath the breeding centre. New educational signs and short films can be seen and visitors can observe the birds at close quarters in enclosures specially designed to resemble the hummingbird's natural habitat. If visitors watch patiently for a while they may see a hummingbird hovering in front of a feeding tube and sipping the nectar. When they are breeding, live images from the breeding centre (which is located above the heads of the visitors) show females building their nests, incubating their eggs or caring for their young. A member of staff is always on hand to answer questions and tell visitors interesting anecdotes and facts about the world of hummingbirds.

Our hummingbirds have now settled in quite well and the breeding season has begun. At the moment one female is building a nest, while another is incubating eggs. A chick hatched in mid-May in the nest of our hardest-working female, who cares for her offspring very well. The staff are very happy with the progress we are making and are looking forward to more chicks hatching during the present breeding season.

Website:www.weltvogelpark.de/E-mail:anne.hoppmann@weltvogelpark.de

FIRST RECORDED CASE OF ACTIVE NESTS OF THE SCARLET MACAW *Ara macao* AND GREAT GREEN MACAW *Ara ambiguus* IN THE SAME TREE IN TROPICAL RAINFOREST IN CENTRAL AMERICA

by David Waugh

The tropical rainforest of the heterogeneous landscape of northern Costa Rica has suffered major fragmentation and its ecological connectivity has been seriously reduced. The National Mixed Wildlife Refuge Maquenque is the last redoubt of the native range of the Endangered Great Green Macaw *Ara ambiguus* in this northern zone. For several years Loro Parque Fundación (LPF) has been supporting the conservation of the Great Green Macaw, through a project which is being conducted in Costa Rica and Nicaragua by the Tropical Science Centre and El Río Foundation. The Scarlet Macaw *A. macao* remains relatively common and widespread in South America, but capture, loss and fragmentation of its habitat have contributed to its decline in Central America.

The populations of the Scarlet Macaw in Costa Rica are fragmented and the species is considered to have disappeared from the Caribbean slope in the 1950s. Only two Costa Rican populations are described, one in the Osa Conservation Area which is estimated to number approximately 700 individuals and the other in the Central Pacific Conservation Area which is estimated to number approximately 330 individuals. Observations, however, indicate that the Scarlet Macaw population has experienced a significant increase since 2003. The Great Green Macaw is limited to the humid lowlands, where the project census conducted in 2009 in the San Juan River basin, indicated a population increase in recent years, with the average number of Great Green Macaws counted in Costa Rica being 302 individuals and a population of 532 individuals in Nicaragua.

The National Mixed Wildlife Refuge Maquenque is mostly tropical rainforest with 3,000mm-3,600mm (approx. 118in-140in) of rainfall distributed throughout the year. It has large trees such as the Almendro *Dipteryx panamensis*, which are up to 60m (approx. 196ft) tall, the Kapok *Ceiba pentandra* and other trees that emerge above the canopy and provide suitable cavities for nesting parrots. It is the only site in Costa Rica where the two populations of macaws occur alongside each other. Sometimes during the nesting season competition for nesting cavities in Almendro trees is observed between pairs of both species, with the outcome usually being that the Scarlet Macaws take ownership of the cavity.

In January 2011, however, Adolfo González, manager of Laguna del

Lagarto Lodge, discovered an Almendro tree 100m (approx. 330ft) from the edge of the forest in a clearing approximately 1,000m (3,280ft) in diameter, with two active nests belonging to pairs of Great Green Macaws and an active nest belonging to a pair of Scarlet Macaws. The project's researchers reported (Chassot et al. 2011) that they visited the site in April 2011 and confirmed the above findings. They found the tree, approximately 45m (147ft) tall, in a state of deterioration, with many cavities in which several pairs of Crimson-fronted Conures *Aratinga finschi* nested. The two nests of the Great Green Macaws were at heights of 23m (approx. 75ft) and 24m (approx. 78ft) and the Scarlet Macaw nest was at a height of 21m (approx. 68ft). The behaviour of the birds indicated that the pair of Scarlet Macaws was rearing young, one of the pairs of Great Green Macaws had young and the other pair was incubating eggs. The pairs showed no hostility towards each other. Researchers had previously observed Almendro trees with several active nests belonging to Great Green Macaws, but never one with pairs of Great Green Macaws and a pair of Scarlet Macaws.

Reference

Chassot, O., Monge-Arias, G., Alemán-Zelaya, I. and González-Tellez, A. 2011. Primer reporte de un árbol con nidos activos de Guacamayo rojo (*Ara macao*) y Guacamayo verde mayor (*Ara ambiguus*) en bosque muy húmdeo tropical de Centroamérica. *Zeledonia* 15 (2).

Dr David Waugh is Director of Loro Parque Fundación, Loro Parque, Tenerife, Canary Islands, Spain. Website:www.loroparque-fundacion.org

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PEKIN ROBINS SEIZED IN BELGIUM

According to a report in a newspaper called The Journal May 31st 2012, p.37, sent to me by my good friend Richard Meyer who lives in north Devon, 154 Pekin Robins *Leiothrix lutea* and 54 chameleons seized from a dealer by the Belgium authorities were sent to the UK and have been distributed among several BIAZA (British & Irish Association of Zoos & Aquaria) collections. Eight of the Pekin Robins and seven of the chameleons have gone to Exmoor Zoo, north Devon, which also houses a number of the waders which belonged to our late President, Raymond Sawyer.

NEWS & VIEWS

TAKING OVER TOUCANS

Following the death of John Ellis (see Obituary pp.95-96), Laura Gardner is taking over as Coordinator of the Special Interest Group for toucans, toucanets and araçaris. In addition, Laura will continue as Coordinator for the Special Interest Group for the Blue-crowned Laughingthrush *Dryonastes courtoisi*. Please note that Laura's new e-mail address is:toucan1@hotmail.co.uk. The full list of Special Interest Groups and the Coordinators can be viewed on the society's website:www.avisoc.co.uk

* * *

SAVING THE BLACK-THROATED FINCH

We are all aware of the threats to the Gouldian Finch *Erythrura gouldiae* (see Vol.117, No.1, pp.2-6 (2010)), but how many of us I wonder are aware of the plight of the Black-throated Finch *Poephila cincta* - sometimes, particularly in the past, also known as the Parson Finch on account of its black bib (it also has a black bill)?

Its plight is highlighted in the latest issue of *Australian birdlife* Vol.1, No.2, June 2012. There are two distinct subspecies, the northern black-rumped subspecies *P. c. atropygialis* (Diggles's Finch) and the southern white-rumped nominate subspecies *P. c. cincta*. The latter has disappeared from up to 80% of its former range and apparently is no longer to be found in New South Wales and has largely disappeared from southern and central Queensland. This dramatic decline has been linked to large scale landscape changes associated with agriculture and pastoralism. The latest threat, however, comes from a proposed coal mining development, one of the largest in the world covering almost 700,000 hectares (approx. 1,730,000 acres), in the Galilee Basin in central Queensland, right in the middle of which is the Bimblebox Nature Refuge, where the Black-throated Finch was discovered recently - the most southerly record of the nominate subspecies in many years. Urban expansion around Townsville threatens remaining key habitat.

Further information about the Black-throated Finch, management of its habitat and the work of the Black-throated Finch Recovery Team can be found by visiting the website:www.blackthroatedfinch.com

The annual Gouldian Finch census will take place at Wyndham, in the eastern Kimberley region of Western Australia, during the first week of September. Those taking part in the census will have a unique opportunity to see Gouldian Finches in the wild, as well as Star Finches *Neochmia ruficauda*, Crimson Finches *N. phaeton*, Long-tailed *P. acuticauda* and Masked Grassfinches *P. personata*, Yellow-rumped *Lonchura flaviprymna* and Chestnut-breasted Mannikins *L. castaneothorax*, Bicheno or Double-

barred Finches *Taeniopygia bichenovii*, Zebra Finches *T. guttata* and Pectorella Finches *Heteromunia pectoralis*. Less than an hour's drive away they may also succeed in seeing the lovely Painted Finch or Painted Firetail *Emblema pictum*.

* * *

GRATIFYING SUCCESSES

By April the breeding season was in full swing for many of the parrots at Loro Parque, Tenerife. Amongst the first species to begin breeding is always the Red-browed Amazon *Amazona rhodocorytha*. It is a species whose breeding behaviour has been studied there for many years. Pairs kept separately have never laid eggs, they only breed when housed in a group. Its present group consists of four experienced breeding pairs (thought to be the ideal number), which began breeding in early spring. The first eggs were placed in an incubator and the first three chicks had hatched. Three of the four females had already laid a second clutch of eggs, which the parents were being left to incubate and rear the young. A second potential breeding group, made up of Loro Parque-bred birds, is being established in a second large aviary and it hopes to develop a long-term breeding programme for this species, which is becoming increasingly rare in the wild. A pair of Yellow-faced Amazons *Alipiopsitta xanthops* was raising a chick and a trio, consisting of a male and two females, was getting along well and one of the females was incubating a clutch of eggs.

During the past 10 years, the Blue-crowned Lorikeet *Vini australis* has bred regularly at Loro Parque, which now has six pairs. However, some of the pairs had repeatedly been producing infertile eggs, especially those which could see other pairs in nearby aviaries. As soon as these aviaries were screened from each other, two pairs promptly produced fertile eggs and each of the pairs was rearing a chick.

A pair of Green-winged Macaws *Ara chloropterus* transferred from public exhibition to the breeding station had raised two young. Three of the parque's *Poicephalus* spp., the Senegal Parrot *P. senegalus*, Brown-necked Parrot *P. robustus fuscicollis* and Brown-headed Parrot *P. cryptoxyanthus* had reared young. The first two species have bred there regularly for many years, but the Brown-headed Parrots had not bred for a number of years, so this was a particularly gratifying success.

With the objective of getting the White-eared Conures *Pyrrhura leucotis emma* breeding again, the three remaining birds, two males and a female, were placed together in a new aviary. This seemed to do the trick, as five young were being fed by all three adults. Also by May, a pair of Gang-gang Cockatoos *Callocephallon fimbriatum* was incubating two eggs as was a pair of Hyacinth Macaws *Anodorhynchus hyacinthinus*.

John Ellis, Senior Curator of Higher Vertebrates and Horticulture at the Zoological Society of London (ZSL) - and an Avicultural Society Council Member - collapsed during his presentation at the European Association of Zoos and Aquaria (EAZA) workshop on zoo involvement in avian conservation held at Weltvogelpark Walsrode in Germany. He was rushed to hospital but died later. John was just 53 years of age.

OBITUARY

JOHN ELLIS

Any attempt to classify John would be a taxonomic enigma, but I think, the closest we might come to a parallel taxon would be that of the Shoebill - big, bold, beautiful (in the eye of the beholder), something every aviculturist wants and evolutionary distinct! It is also somewhat apt that it just happened to be one of John's favourite birds.

John had a passion for birds, birdwatching, aviculture and almost everything avian that was perhaps rivalled only by the late Jean Delacour and Raymond Sawyer. It is not unreasonable to mention John's name amongst some of these avian greats, as John was certainly one of the best modern bird curators and aviculturists of our generation.

John's legacy is immense. He developed some wonderful avian experiences with Penguin Beach at London Zoo encapsulating his vision of combining spectacular displays of birds underpinned by solid mission objectives and advanced welfare. John's brilliant animal training and presentational skills ensured that his audiences left his animal demonstrations with an inspired and increased appreciation of animals and nature. John was a committed conservationist and his recent work with the Corncrake and Asian vultures was an integral part of the success of these collaborative projects.

Colleagues on these projects expressed their great admiration and respect for his knowledge and skills. Perhaps one of John's greatest attributes was his ability to inspire, teach and enthuse others. He had a willingness to share his vast knowledge of birds. Many of us in the profession today valued the mentoring and support that John provided. His teams and colleagues at ZSL are greatly indebted to him.

John's career spanned some 37 years beginning as a bird keeper at Chester Zoo in 1975, where he primed his talent for incubation and hand-rearing. In April 1979, John moved to Jersey Wildlife Preservation Trust, which gave him the chance to become involved in many of the breeding projects for endangered species. Later, at Dr Henry Quinque's collection in France,

John had the wonderful opportunity to work with Kagu and it was there that he developed a lifelong love of hummingbirds, which led to his ambition to establish a self-sustaining population of hummingbirds in EAZA zoos.

From France, John moved to Kelling Park Aviaries in Norfolk and then in 1985 to Ocean World Rhyl. There John was able to indulge two of his other passions, horticulture and sealions. Following a dalliance with the commercial pet world, John moved to Chessington World of Adventures as Senior Keeper in 1994. It was there that John honed his art of presentation and produced one of the best zoo sealion demonstrations.

In December 2000, John became Curator of Birds at ZSL. He was immensely proud to be following in the footsteps of some of the zoo's previous avian experts. Under John's leadership it became a centre of excellence for toucans and the recent breeding of sunbirds was of great pride to John, who in 2006, was promoted to Senior Curator and also became responsible for horticulture. This reflected another expert side to John whose ability to blend aviculture and horticulture was remarkable.

John took on many roles in his career, including Studbook Keeper for the Toco Toucan and various TAG (Taxon Advisory Group) chairs. He was also an enthusiastic EAZA and BIAZA (British & Irish Association of Zoos & Aquaria) colleague. For a period in the late 1990s he was chair of ABWAK (Association of British Wild Animal Keepers). John was also a committed supporter and member of the Avicultural Society.

All of us who knew John, who worked with him or who just shared a few glorious moments of laughter with him will miss him deeply. Our heartfelt thoughts go out to his wonderful family, his brilliant boys and his devoted partner.

John's family have set up a charity page in memory of John on which you can donate to one of his favourite projects - The Asian Vulture Recovery Project in Nepal. Website:justgiving.com/In-Memory-of-John-Ellis

We have lost a giant of the bird world way too soon. Let us hope that he is up there enjoying a G&T with Raymond.

David Field
Zoological Director
Zoological Society of London

IN MEMORY OF JOHN

The Avicultural Society has made a donation of £200 (approx. US$300) to the Asian Vulture Recovery Project in Nepal in memory of John Ellis.

LONGEST LIVED PARROTS

In an attempt to overcome some of the difficulties scientists encounter when trying to study the lifespans of wild parrots, Anna Young and her team turned to ISIS (International Species Information System) and analysed the records of more than 80,000 captive parrots on its global database, to see what they could learn about the lifespans of these birds.

Their findings were published in *PsittaScene*, pp.12-15, May 2012. The longest lived parrot they found was a Moluccan Cockatoo *Cacatua moluccensis* that lived to be 92 years old. On the whole, however, parrots were not as long-lived in captivity as Anna and her team expected. The records of 260 species were analysed and only 11 other species besides the Moluccan Cockatoo included an individual which lived longer than 50 years in a zoo. Over half of the parrot species lacked an individual which lived more than 22 years. Cockatoos had the highest average maximum lifespan, but macaws and Amazons had higher average median lifespans. This means that although cockatoos have the potential to live longer, many are not as long-lived on average as some individual macaws and Amazons.

The longest lived captive parrots (based on ISIS records), each with an individual living 50 years or longer, are: Moluccan Cockatoo *Cacatua moluccensis*, Leadbeater's or Major Mitchell's Cockatoo *Lophocroa leadbeateri*, Sulphur-crested Cockatoo *C. galerita*, Roseate Cockatoo or Galah *Eolophus roseicapilla*, Yellow-naped Amazon *Amazona ochrocephala*, Green-winged Macaw *Ara chloroptera*, Golden Conure *Guaruba guarouba*, Ducorp's Corella *C. ducorpsii*, Red-tailed Black Cockatoo *Calyptorhynchus banksii*, Military Macaw *A. militaris*, Hyacinth Macaw *Anodorhynchus hyacinthinus* and Kea *Nestor notablilis*.

The current trend is for present day parrots to outlive those of previous generations, indicating that the care of captive parrots is improving. Unsurprisingly perhaps, the larger species of parrots generally live longer than the smaller species.

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Published by the Avicultural Society, England.